

# NASA TECH BRIEF

## Marshall Space Flight Center



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### Solar-Energy Absorber: Active Infrared (IR) Trap

#### The problem:

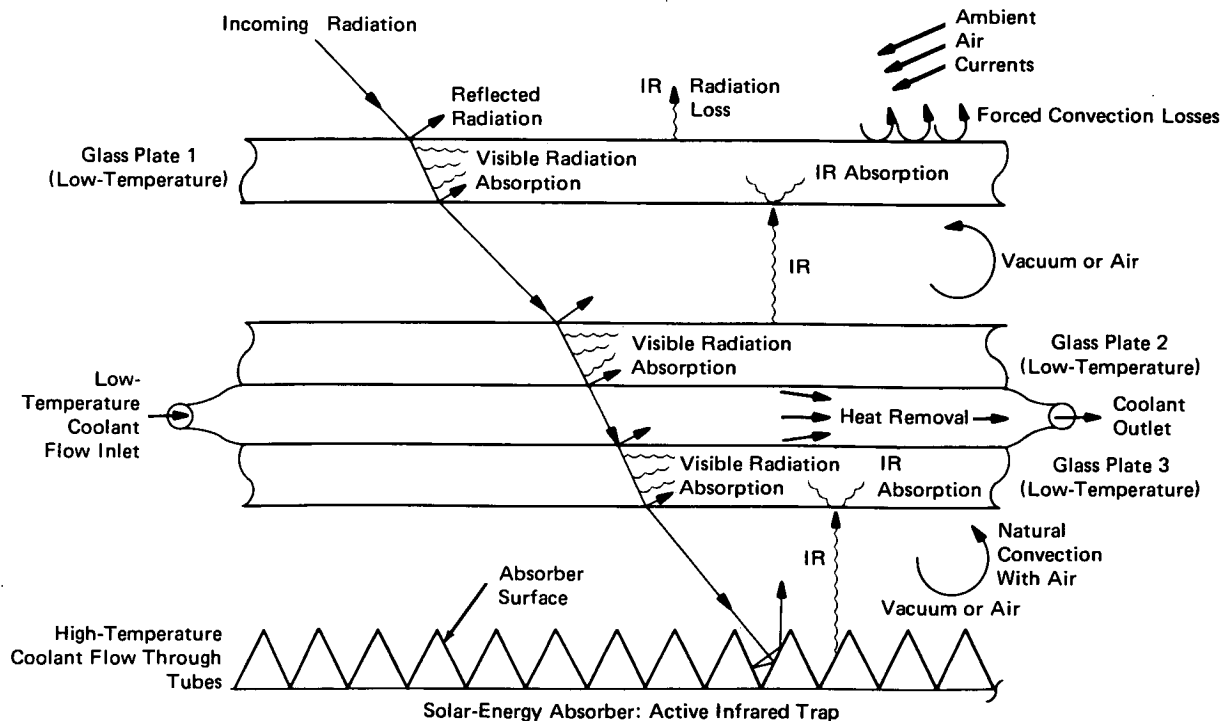
Present solar-energy absorbers, used in trapping solar radiation for thermal-to-electrical conversion systems, have efficiencies reaching 86 percent. The basic reason for the energy loss is the absorber configuration. A typical absorber collects solar heat through several glass plates located above the actual absorber surface. The transfer of heat from one plate to another depends on the temperature difference between them: the larger this difference, the more effective the heat transfer. However, as the plates absorb infrared energy, they heat up. The result is that their temperature differences minimize, thus reducing the effectiveness of heat transfer.

#### The solution:

The efficiency of solar-energy absorbers may be improved to 95 percent by actively cooling their intermediate glass plates.

#### How it's done:

In the solar-energy absorber shown in the illustration, a clear liquid or gas coolant is conveyed between two of the glass plates. The coolant removes the infrared heat trapped in the glass. As a result, the temperature difference between the plates is maximized, hence the effectiveness of heat transfer is improved. The new configuration improves absorber efficiency to 95 percent. Further improvements in absorbing efficiency may be accomplished by additional cooling between other intermediate plates.



(continued overleaf)

**Notes:**

1. The new approach may be of interest to manufacturers of solar absorbers and to engineers and scientists developing new sources of energy.
2. Requests for further information may be directed to:  
Technology Utilization Officer  
Marshall Space Flight Center  
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Reference: B73-10484

**Patent status:**

Inquiries concerning rights for the commercial use of this invention should be addressed to:

Patent Counsel  
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Code A&PS-PAT  
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